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10/539,622	06/17/2005	Bruno Le Breton	4590-425	4601

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EXAMINER	
PATEL, DHAVAL V	
ART UNIT	PAPER NUMBER
2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/539,622	LE BRETON ET AL.	
	Examiner	Art Unit	
	DHAVAL PATEL	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/9/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because of minor informalities

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract should not be the recitation of the claim language

Appropriate Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2-4,13,14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the mean width of the frequency band" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim. The mean width of the frequency band has not been claimed anywhere in claim 1.

Claims 3 and 4 are rejected because of dependent upon claim 2 and claim 2 is rejected.

Claim 13 recites the limitation "the error correction coder" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the interleaver" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 recites the limitation "the error corrector coder" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 is rejected because of dependent upon claim 13 and claim 13 is rejected.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 13, 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sano et al. (US 7,272,162) (hereafter Sano).

Regarding claim 13, Sano discloses a receiver (Fig. 11, receiver) of digital signals conveyed on a given useful frequency band (Fig. 11, frequency converter, 32) by a transmitter (Fig. 2, transmitter) comprising a demodulator (Fig. 11, demodulator, 34a) wherein: a decoder (Fig. 11, decoder, 42) associated with the error corrector coder (Fig. 4a, encoder, 1) of the transmitter (Fig. 2) receiving the digital signal

recombined s[m] (Fig. 11, signals #1 thru #N) by the demodulator (Fig. 11, demodulator, 34a).

Regarding claim 14, Sano discloses a receiver (Fig. 11) of digital signals conveyed on a given useful frequency band by a transmitter (Fig. 2) comprising

- a demodulator (Fig. 11, demodulator, 34a)

-a deinterleaver (Fig. 11, deinterleaver, 41) associated with the interleaver (Fig. 2, interleaver, 2) of the transmitter (fig. 2) receiving the digital signal recombined g[m] (Fig. 11, signals, #1 thru #n) by the demodulator (Fig. 11, demodulator, 34a),

-a decoder (Fig. 11, decoder, 42) associated with the error corrector coder (fig. 11, encoder, 1) of the transmitter (Fig. 2) receiving the digital signal recombined deinterleaved c[m] by the deinterleaver (Fig. 11, deinterleaver, 41).

Regarding claim 16, Sano further discloses use of the receiver (Fig. 11) for conveying digital signals in the FM band (Fig. 8 and Fig. 9).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***

a. Determining the scope and contents of the prior art;
b. Ascertaining the differences between the prior art and the claims in issue;
c. Resolving the level of ordinary skill in the pertinent art; and
d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

7. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laamanen et al. (WO/98/58471) (see IDS) in view of Wright et al. (US 6,704,297) (hereafter Wright).

Regarding claims 1 and 8, Laamanen discloses a method and apparatus of modulating a digital signal of width L in frequency on a given useful frequency band comprising:

a separation of separating the digital signal into N blocks b. (1< n <N) (page 3, lines 1-5),

splitting the given useful frequency band into N contiguous parts pn (page 4, lines 2, lines 23-25, sub channels in multi-carrier system),

each block of digital signals bn over the associated channel Cn (page 3, lines 1-5 and lines 14-15).

Furthermore, Laamnen discloses that the sub channels of a multi-carrier system may be allocated equal or unequal bandwidths (claimed as different bandwidth) and they can be spaced apart (claimed as frequency bands are separated) over the frequency spectrum.

However, Lammanen does not explicitly disclose defining channels Cn, of width In in frequency, lying within an associated part Pn, the channels Cn being separated.

In the same field of endeavor, Wright teaches frequency division multiple access (FDMA) technique. Within each sub band, the sub band may be further divided into multiple channels using FDMA. On the downlinks, each ground cell typically operates on at least one carrier or channel (col. 1 lines 26-35 and col. 4 lines 15-33).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention, to incorporate such frequency multiplexing technique, as taught by Wright, into the system of Lammanen, to send or distribute blocks of data to a particular channel within sub-bands (it is already established that sub-bands are separated and can be of unequal width), the motivation is efficient bandwidth allocation.

Regarding claim 2, Lammanen further discloses the method of modulation (page 4, lines 9-10, multi-carrier modulation) as claimed wherein the channels Cn are defined by taking account of a predetermined minimum distance between the channels (page 4, lines 9-11).

Regarding claims 3 and 4, the combined teachings of Lammenen and Wright do not explicitly disclsoes the method of modulation comprising:

determining the minimum distance between the channels, the minimum distance being determined as a function of the number N of channels, of their width In, and of the mean width of the frequency band affected by the phenomenon of flat fading. The

method of modulation wherein the minimum distance is determined such that minorities of channels Cn are affected by the phenomenon of fiat fading.

However, Lammenen discloses that sub bands are spaced equally or unequally and also sub bands may be of equal width or unequal width. One of ordinary skilled in the art would recognize that whole frequency band is divided into multiple sub bands and to avoid interference between sub bands, they may be separated by distance. Furthermore, in multi-carrier system, some of the sub bands are narrow so as to transfer more data in narrow bandwidth to avoid interference or fading. Such factors would be obvious to calculate distance between channels so as to mitigate the effects of interference or fading.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to determine distance between channels based on the widths of the channels and total number of channels to effects by fading, the motivation is to allocate bandwidths efficiently.

Regarding claims 5, Lammanen further discloses the method of modulation as claimed in the claim 1, wherein the channels Cn are of identical widths equal to an Nth of the width of the digital signal L: In = L/N, 1<n<N (page 4, lines 9-13).

Regarding claim 6, Lammanen and Wright do not explicitly discloses The method of digital modulation as claimed in the claim 1 wherein: the digital signal is separated into N = 2 blocks b,the given useful frequency band is split into N = 2 parts

pn, the first block bl is distributed over a channel Cl of width L/2 lying within the first part Pl of the given useful frequency band and the second block bl is distributed over a channel C2 of width L/2 lying within the second part P2 of the given useful frequency band.

However, Lammnen discloses that the subchannels of a multicarier system may be allocated equal bandwidths in the frequency spectrum and they can be space at equal or unequal distance from each other over the frequency spectrum. One of ordinary skilled in the art would easily recognized that the frequency band could be split into two bands instead of N bands so that two blocks of data could be modulated to the two subbands. Furthermore, both bands are seperated. Wright discloses that user data can be transferred within one suband using one particular channel.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Wright, into the system of Lammenen, so as to use the particular channel within first sub band to transfer first block of data and second channel within second subband, separated by equal distance, to transfer the second block of data, the motivation is adaptive bandwidth allocation and less complexity.

Regarding claim 7, Lammanen further discloses the method of modulation as claimed in the wherein the given useful frequency band is the FM band (page 4, lines 9-15).

Regarding claim 9, Lammenen discloses a demodulator of digital signals conveyed on a given useful frequency band by a transmitter comprising a modulator (Fig. 3, modulator multiplexing incoming data into the sub carrier) comprising:

means of scanning N blocks bn of signals distributed over these channels (Fig. 3, channel), means of recombination of the channels into a digital signal g[m] (Fig. 3, recombined multiple parallel channel data d1..dn).

However, Lammenen does not explicitly disclose combining N channels Cn reading of the N blocks of signals distributed over the channels and combining N channels Cn.

In the same field of endeavor, Wright teaches FDMA technique in which frequency band is divided into subbands, which are further divided into the channels for data communication.

Therefore, for the same motivations established for claims 1 and 8, it would have been obvious to one of ordinary skilled in the art at the time of the invention to use such FDMA technique to multiplexed input data to particular channel within subband and combine the blocks of data to recover the data.

8. Claims 10-12, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laamanen and Wright, as applied to claim 8 above, and further in view of Yong et al. (US 6,801,570) (hereafter Yong).

Regarding claim 10, the combined teachings of both Lammenen and Wright do not explicitly discloses a transmitter of digital signals on a given useful frequency band

comprising at least one transmission chain comprising a modulator wherein the transmission chain comprises an error corrector coder conveying the coded digital signal cq[m] to the modulator.

In the same field of endeavor, Yong teaches transmission of digital signals comprising a modulator (fig. 1, element 130) and error corrector (Fig. 1, element 120) and error corrector is conveying the coded signal to the modulator for transmission (Fig. 1).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to use such modulator and error correction coder, as taught by Yong, into the system of both Lammanen and Wright, as a whole, so as modulating the data to a sub band, the motivation is the efficient transmission.

Regarding claim 11, the combined teachings of both Lammenen and Wright do not explicitly disclose the transmitter wherein the transmission chain comprises an interleaver placed between the error corrector coder and the modulator.

In the same field of endeavor, Yong teaches interleaver (Fig. 1, element 125) in transmitter, placed between error corrector coder (Fig. 1, element 120) and modulator (Fig. 1, element 130).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to use such interleaver, as taught by Yong, into the system of both Lammenen and Wright, as a whole, so as to interleaving the signal with particular channel within subband, the motivation is to reduce burst errors.

Regarding claim 12, The transmitter as claimed in the claim 102 wherein with each of the Q transmission chain is associated a distinct set of channels {cq.} is associated with each of the Q transmission chains.

Regarding claim 15, Lammanen further discloses use of the transmitter for conveying digital signals in the FM band (page 4, lines 9-15).

Regarding claims 17, Lammanen is silent about a receiver of digital signals conveyed on a given useful frequency band by a transmitter as claimed in claim 10 comprising a demodulator wherein: a decoder associated with the error corrector coder of the transmitter receiving the digital signal recombined g[m] by the demodulator.

In the same field of endeavor, Wright teaches transmission system of digital signals wherein a transmitter comprising a demodulator (Fig.l 1 , 130) wherein a decoder associated with error corrector coder of transmitter (Fig. 1, error correction, 120) receiving the digital signal recombined by the demodulator (Fig. 1, demodulator, 130).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to use such modulator and error correction coder, as taught by Yong, into the system of both Lammanen and Wright, as a whole, so as modulating the data to a sub band, the motivation is the efficient transmission.

Claim 18 is rejected on same rationale claim 17 is rejected. Refer to claim 17 rejections.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patel Dhaval whose telephone number is (571) 270-1818. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Dhaval Patel/

Acting Examiner of Art Unit 2611, 4/18/2008
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611